



THERMAL PRINTING SOLUTIONS

MADE IN EUROPE

USER MANUAL

APOS KANJI PRINTER

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- Table of contents

1. GENERAL DESCRIPTION	4
2. SPECIFICATIONS	5
2.1. PHYSICAL SPECIFICATION	5
2.1.1. <i>Dimensions</i>	5
2.1.2. <i>Printhead Specification</i>	5
2.1.3. <i>Power Supply</i>	5
2.2. ENVIRONMENTAL SPECIFICATION	5
2.2.1. <i>Environmental Conditions</i>	5
2.2.2. <i>EMI,ESD and XXX</i>	5
2.3. OPERATIONAL PERFORMANCE	6
2.3.1. <i>Data Hold Up</i>	6
2.3.2. <i>Paper Specification</i>	6
2.3.3. <i>Speed</i>	6
2.3.4. <i>Lifetime</i>	6
2.4. WARRANTY	7
2.5. ORDER CODES	8
3. GETTING READY TO USE THE PRINTER	9
3.1. UNPACKING THE PRINTER	9
3.2. DESCRIPTION OF PRINTER PARTS	9
3.2.1. <i>Buttons</i>	9
3.2.2. <i>Indicator</i>	9
3.2.3. <i>Cutter (Optional)</i>	9
3.2.4. <i>Connectors</i>	10
3.2.5. <i>Cable Traps</i>	10
3.2.6. <i>Mounting Holes</i>	10
3.2.7. <i>Sensors</i>	10
3.3. CHOOSING THE LOCATION FOR INSTALLATION	10
3.4. INSTALLING PAPER	11
3.5. MAINTENANCE	11
3.5.1. <i>Cleaning the Printer</i>	11
3.5.2. <i>Cleaning the Printhead</i>	11
3.6. CONNECTORS & CABLES	12
3.6.1. <i>Power Connector</i>	12
3.6.2. <i>Communications Interface Connectors</i>	12
3.6.3. <i>Draw Kick-out Connector</i>	13
3.7. CONFIGURATION OF SWITCHES	14
3.7.1. <i>RS232 mode</i>	14
3.7.2. <i>Centronics mode</i>	14
3.8. SELF TEST	15
4. PRINTER CONTROL SOFTWARE	16
4.1. PRINTABLE CHARACTERS	16
4.2. PRINTER CONTROL CODES	19
4.2.1. <i>ESC =</i>	20
4.2.2. <i>AX P</i>	20
4.2.3. <i>ESC v</i>	21
4.2.4. <i>AX V</i>	21
4.2.5. <i>ESC @</i>	21
4.2.6. <i>ESC c5</i>	22
4.2.7. <i>ESC R</i>	22
4.2.8. <i>ESC D</i>	23
4.2.9. <i>ESC 3</i>	23

4.2.10. ESC 2	23
4.2.11. ESC SP	24
4.2.12. ESC !	24
4.2.13. ESC –	25
4.2.14. ESC E	25
4.2.15. ESC G	26
4.2.16. ESC í	26
4.2.17. ESC V	26
4.2.18. HT	26
4.2.19. ESC \$	27
4.2.20. ESC ¥	27
4.2.21. ESC a	27
4.2.22. LF	28
4.2.23. ESC d	28
4.2.24. ESC J	28
4.2.25. ESC i	28
4.2.26. ESC m	29
4.2.27. AX C	29
4.2.28. GS w	29
4.2.29. GS h	29
4.2.30. GS k	30
4.2.31. GS f	30
4.2.32. GS H	31
4.2.33. ESC &	31
4.2.34. AX &	32
4.2.35. ESC %	32
4.2.36. GS *	33
4.2.37. GS /	33
4.2.38. ESC *	34
4.2.39. ESC p	35
4.2.40. ESC u	35
4.2.41. GS C0	36
4.2.42. GS C1	36
4.2.43. GS C2	37
4.2.44. GS C	37
4.2.45. GS c	38
4.2.46. GS :	38
4.2.47. GS ^	38
4.2.48. FS !	39
4.2.49. FS &	39
4.2.50. FS -	39
4.2.51. FS	40
4.2.52. FS S	40
4.2.53. FS W	40
4.2.54. FS 2	40
5. SPARE PARTS.....	42

1. GENERAL DESCRIPTION

This user manual describes how to set up and operate the high-speed, thermal, point-of-sale (POS) printer manufactured by Axiohm SA. The printer has many features which offer advantages to retailers and is versatile enough to be used in other applications such as ticketing and couponing.

- The fixed-head thermal printer engine makes this the fastest POS printer on the market while producing a very high quality print. The retailer can therefore achieve a higher output at the checkout and improve customer satisfaction.
- Axiohm's unique, patented paper-loading mechanism makes this the easiest-to-use POS printer on the market. A paper roll can be changed by an untrained operator quickly and reliably, minimising down-times and avoiding paper jam. There are no messy ribbons to change and so good print quality can be 'designed-in' without being dependent on operator skill or regular maintenance.
- The printer uses Axiohm's proprietary thick-film technology to achieve the longest-life printheads on the market. The optional patented semi-rotating ceramic cutter is also the longest-life cutter on the market so, overall, the APOS printer has exceptionally high reliability. This can significantly reduce the cost of maintenance and helps to make the total cost of ownership 'very attractive' compared to less reliable technologies.
- As part of the total 'ease-of-use' philosophy, the printer uses a super-set of industry-standard software to allow the system integrator to plug-in and go. Your existing software investment can be exploited without modification. The APOS printer will accurately print many barcodes, it allows custom characters to be down-loaded and it can execute macro functions.
- An optional novel vertical-mounting kit allows the printer to be used economically while using the smallest foot-print possible for a printer of this capacity. The stylish appearance has been specifically designed to allow the printer to look 'at home' when mounted horizontally or vertically on a counter or wall-mounted to give maximum freedom in the POS layout.
- There is a choice of interface options including RS232 for greatest compatibility, and also a Centronics parallel version for very high data-rate graphics-oriented applications. For ticketing and couponing, Axiohm's novel "page-mode" software may be used together with extra internal memory to allow the storage of and high speed manipulation of complex graphics, text, icons and barcodes.

2. SPECIFICATIONS

2.1. Physical Specification

2.1.1. Dimensions

Height	115mm
Width	170mm
Depth	205mm
Weight (with cutter)	1390 g

2.1.2. Printhead Specification

The APOS printer uses a fixed-head thermal printhead, designed and manufactured by Axiohm using proprietary thick-film techniques to ensure the highest performance.

Printhead Type:	Thermal Line
Printing width:	72 mm
Number of dots across width:	576
Resolution (dot-density):	8 dots / mm

2.1.3. Power Supply

The printer requires a power supply of 24V at 2A minimum. Other voltages which are required internally for the micro controller and the communications ports are generated internally from the 24V supply.

Specification:

Output Voltage: 24 VDC (no load)
Output current: 2.0 A mean continuously
10 A peak during 4ms max (pulse cycle =30ms)

2.2. Environmental Specification

2.2.1. Environmental Conditions

Operating Temperature:	0°C - +50°C
Storage Temperature:	-40°C - +70°C
Maximum Humidity:	90% RH (non-condensing)

2.2.2. EMI,ESD and XXX

The printer is designed to meet the requirements of:

EN55022 class A
FCC class A.
EN50082-1
ANSI/UL1950
EN60950
CAN/CSA C22.2 No 950

2.3. Operational Performance

2.3.1. Data Hold Up

A backup capacitor is fitted to the APOS printer to hold up RAM data for a minimum of 1.5hrs after losing external power. This means that all downloaded fonts, logos and bitmaps will be retained for the data hold up period. However, the context of the printer is not saved which means that the printer will revert to its initial state when power is returned.

2.3.2. Paper Specification

Paper width	80mm
Maximum paper roll diameter	80mm
(Maximum paper roll length)	82m (using 60gsm paper)
Recommended papers	AXIOHM ref 3101123 KANZAKI F380
Emulsion (sensitive) side	On outside of roll

* Please contact Axiohm if you wish to use an alternative paper type otherwise your warranty may be invalid and you may cause damage to your printer.

2.3.3. Speed

The printer is capable of printing at a maximum speed of 60mm/s with 40% of the dots on (during 40% of the time) provided that sufficient power supply current is available. (See section 2.1.3 about power supply requirements) The printer can achieve a speed of approximately 50mm/s when printing simple text using the standard 2A power supply unit.

The actual speed may also be affected by the data rate at which information is sent to the printer over the communication link. Sending large amounts of graphic data may reduce the actual speed.

2.3.4. Lifetime

The lifetime is dependent on the actual operating conditions and is defined by the MTBF of the electronics and the wear characteristics of the electromechanical parts. The actual lifetime will therefore be the minimum of the following three categories depending on the particular application:

- Electronic MTBF of 40,000 hrs of powered use
- 90km of paper used by the printer (with typically 15% of the dots heated)
- One million cuts from the ceramic cutter mechanism

2.4. Warranty

The supplied printers or spare parts are guaranteed for a period of 6 (six) months beginning at the date of delivery (ex-works).

The printers are guaranteed against defective material and/or workmanship. The warranty covers solely, and at Axiohm's choice, the cost of repair or replacement by Axiohm in its factory, after restitution by the customer, of the printers or spare parts admitted by AXIOHM to be defective, excluding assembling, dismounting, shipping and other expenses.

The implementation of the warranty will not extend the warranty period.

Due to the complexity of the electronic and mechanical techniques used in the operation of such a printer, AXIOHM does not warranty particular results for its installation out of the published specifications.

This warranty is subject to strict compliance with AXIOHM's technical instructions for installation, use and maintenance.

In particular, this warranty will not be valid for any defects due to:

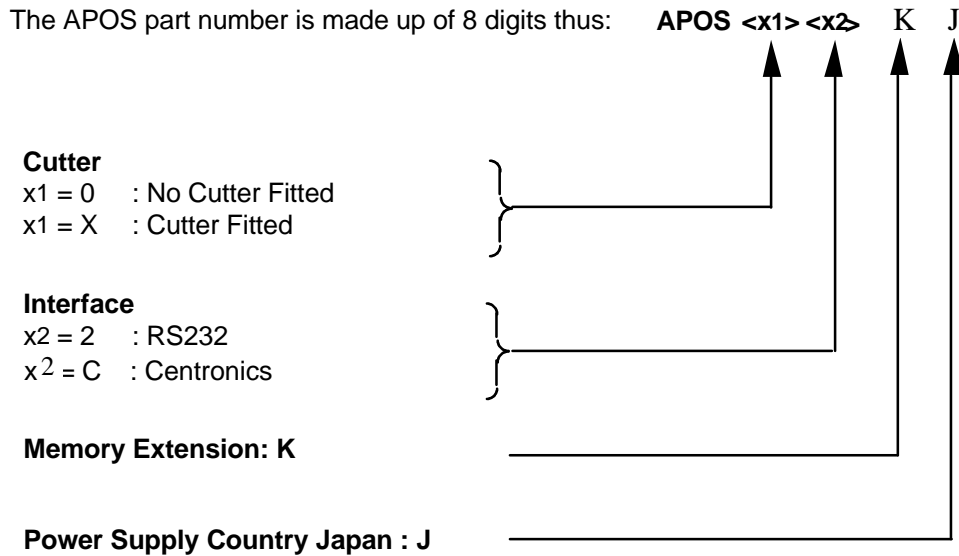
- Use of thermal papers other than those recommended by AXIOHM.
- Incorrect maintenance.
- Defective installation or modification not approved by AXIOHM.
- Non-compliance, during any period, with the specified working conditions including the electrical power supply specifications.
- Abnormal wear or mechanical damage, including dot burning due to power overloads.
- Transportation in packaging other than the type of carton / foam insert in which the printer was originally.

Any transportation, storage or setting up which does not comply with the technical specifications given to the customer by AXIOHM, or its official distributor, will invalidate this warranty.

In no event shall AXIOHM assume any liability in excess of that defined above. It is agreed that AXIOHM will not be liable for any indemnity for accidents to persons, damage to property or for loss of earnings.

2.5. Order Codes

It is clear from the preceding sections that the APOS printer is available in many variants. The table below shows the valid product codes which are used to describe each version.



eg. A printer supplied for use in Japan with a cutter and an RS232 interface would be specified as **APOSX2KJ**.

Note that Axiohm may supply custom versions of the APOS printer to suit specific applications. In this event, the product code will be **APOSSxxx** where xxx is a serial number which defines the special version.

3. GETTING READY TO USE THE PRINTER

3.1. Unpacking the Printer

The printer will be supplied packaged in a plain cardboard carton with a re-usable packing foam insert. The carton contains separate pockets for:

- the APOS printer
- a single 80m roll of thermal paper
- a standard power supply with 24V power lead (optional)
- a 1.80 m CEE22 power cable with the appropriate mains plug for the country of sale

The exterior of the carton will be marked with the model number and serial number (including manufacturing week and batch number) of the printer it contains.

Please make sure that no parts are missing or damaged and report any deficiencies to your supplier as soon as possible after receipt of the printer and please keep the original packaging material in case you need to transport or return your printer.

3.2. Description of Printer Parts

The APOS printer is based around a patented easy-loading printer mechanism designed and manufactured by Axiohm. This mechanism consists of a main cavity into which a paper roll is dropped for loading. The thermal print head is at the front of this cavity and a rubber roller is attached to the lid of the mechanism. When the lid is closed, the paper is trapped between the rubber roller and the printhead to give a close alignment and a consistent pressure.

3.2.1. Buttons

The APOS printer has two buttons on the front panel:

The ON/OFF button is physically connected to the hard reset on the main controller board. Even when it is OFF, the printer is always powered.

The Paper Feed button is connected to an i/o pin on the main controller and its normal function is to advance paper when the unit is not printing. The button function may be disabled under software control and it may be used to control the action of a defined macro. This button is also polled on reset to initiate the self-test feature.

3.2.2. Indicator

A rectangular, green LED is used to indicate the basic status of the printer. The LED is off when the printer is off. It is on under normal circumstances when the printer is on. It will flash when there is an error condition such as out-of-paper.

3.2.3. Cutter (Optional)

The printer may be fitted with Axiohm's patented semi-rotating ceramic cutter. This is split with one blade in the lower cavity and the other fitted to the lid. These blades are also correctly aligned as the lid is closed to make paper loading very easy and jam-free. The cutter can be used to perform a partial cut or full cut under software control.

3.2.4. Connectors

The APOS printer can have up to 3 types of connectors:

The Power connector is fitted on the base of the unit near the front. (See §3.6.1 for more details)

The Interface connector is fitted on the base of the unit closer to the rear and may be a 9-pin D-type in the case of serial communications (RS232) or a 25-pin D-type in the case of parallel communications (Centronics option). (See §3.6.2 for more details)

Two Drawer Kick-out connectors are fitted at the rear of the printer. These appear as a pair of RJ11 connectors. (See §3.6.3 for more details)

3.2.5. Cable Traps

Three clips are fitted into the base of the printer which may be used to trap the power supply and interface cables into recessed channels in the base.

3.2.6. Mounting Holes

There are two holes in the base of the printer which allow the printer to be attached to a vertical surface such as a wall or pillar. In this event, the printer should be mounted with the paper exiting near the top so that the paper roll does not fall out when the cover is opened.

3.2.7. Sensors

The APOS printer is fitted with three sensors which detect abnormal conditions:

The Door-Closed sensor is a microswitch sensor. To avoid damaging the printhead, when the door is open, printing is inhibited.

The End-of-Paper (EOP) sensor is a reflective opto-sensor which detects the presence of paper near to the printhead. To avoid damaging the printhead, when no paper is detected, printing is inhibited.

The Cutter Sensor is used to detect that the cutter is placed in its home position before commencing a cut and also on completion of a cut.

3.3. Choosing the Location for Installation

The APOS printer may be installed in a variety of applications but in order to maintain your unit in optimum operating conditions, the following recommendations should be followed:

- Avoid dirty or dusty locations or those with excessive heat or humidity (See §2.2.1 for specifications)
- Choose a stable level base or solid wall on which to mount the printer
- Ensure that there is sufficient space around the printer to use it comfortably including sufficient access to open the lid while installing paper.

3.4. Installing Paper

Please ensure that the correct grade of paper is used with the APOS printer (see §2.3.2). It is extremely easy to load a new paper roll into the printer by following these simple steps:

- Open the cover and remove the old paper core
- Drop the new roll into the reservoir so that it will rotate in the correct direction (i.e. so that the emulsion side of the paper rests against the printhead)
- Hold the front edge of the paper outside the main cavity at the front of the printer
- Close the printer cover

3.5. Maintenance

The APOS printer is a high reliability unit which requires very little maintenance but may benefit from cleaning as detailed below.

3.5.1. Cleaning the Printer

The external surfaces may be kept clean by wiping with a lightly damp cloth but this must only be done after unplugging all electrical connections. Great care should be taken to ensure that the inside surfaces are kept dry at all times and that the external surfaces are thoroughly dry before re-making any electrical connections.

3.5.2. Cleaning the Printhead

Depending of the environment in which the printer is used, the printhead may accumulate dust. Therefore it is necessary to clean it periodically in order to maintain a good print quality. The cleaning period is dependent on the environment and the usage of the printer but the printhead should be cleaned at least once a year or up to once a month in heavy duty applications. The printhead should always be cleaned immediately if the print becomes visibly fainter due to contamination of the printhead. To clean the printhead:

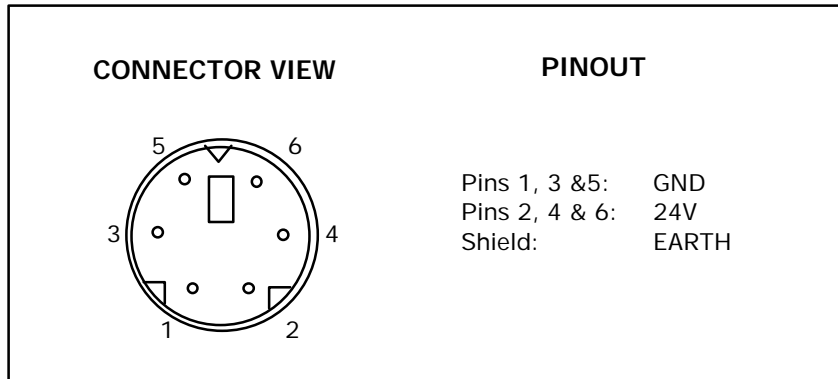
- Switch off the printer. **Never clean the head immediately after printing, the printhead may be hot.**
- Open the printer cover and remove the paper roll.
- Clean the heating dots of the head with a cotton stick containing an alcohol solvent (ethanol, methanol or IPA) but **do not touch the printhead with you fingers !**
- Allow the solvent to dry
- Reload the paper and close the cover

3.6. Connectors & Cables

To reduce the electromagnetic emissions and susceptibility, all cables should be shielded. If you are not using cables supplied by Axiohm for this purpose, please ensure that your cables match the printer and are rated at the appropriate voltage and current capacities. **Use of an inappropriate cable may seriously damage your printer !**

3.6.1. Power Connector

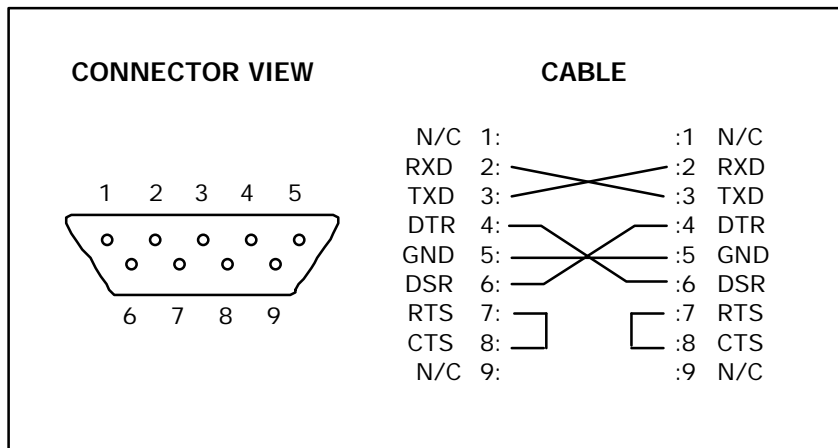
The connector is a shielded 6-pin mini-Din plug.



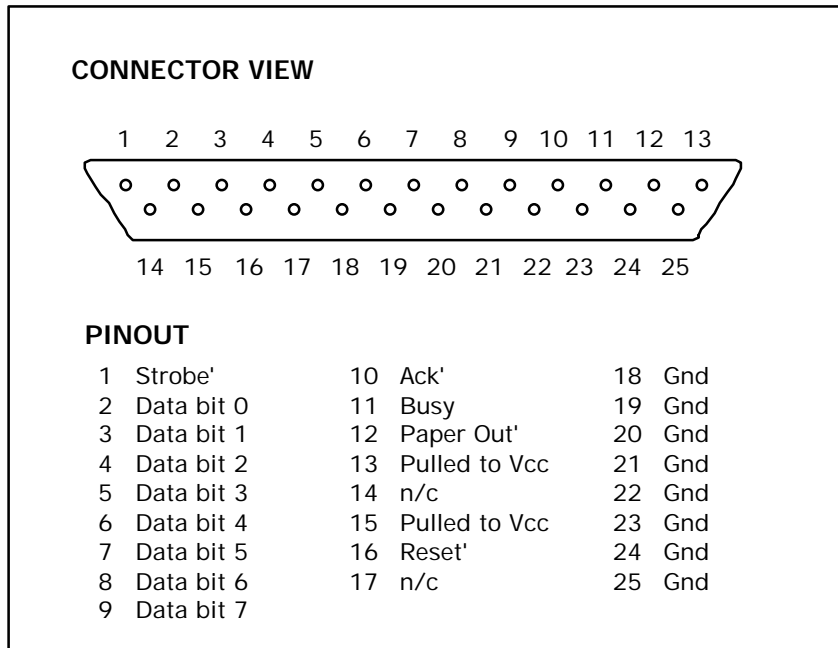
3.6.2. Communications Interface Connectors

Both RS232 and RS485 interfaces use 9-pin D-type connectors but the Centronics interface uses a 25-pin D-type connector.

RS232 Connector

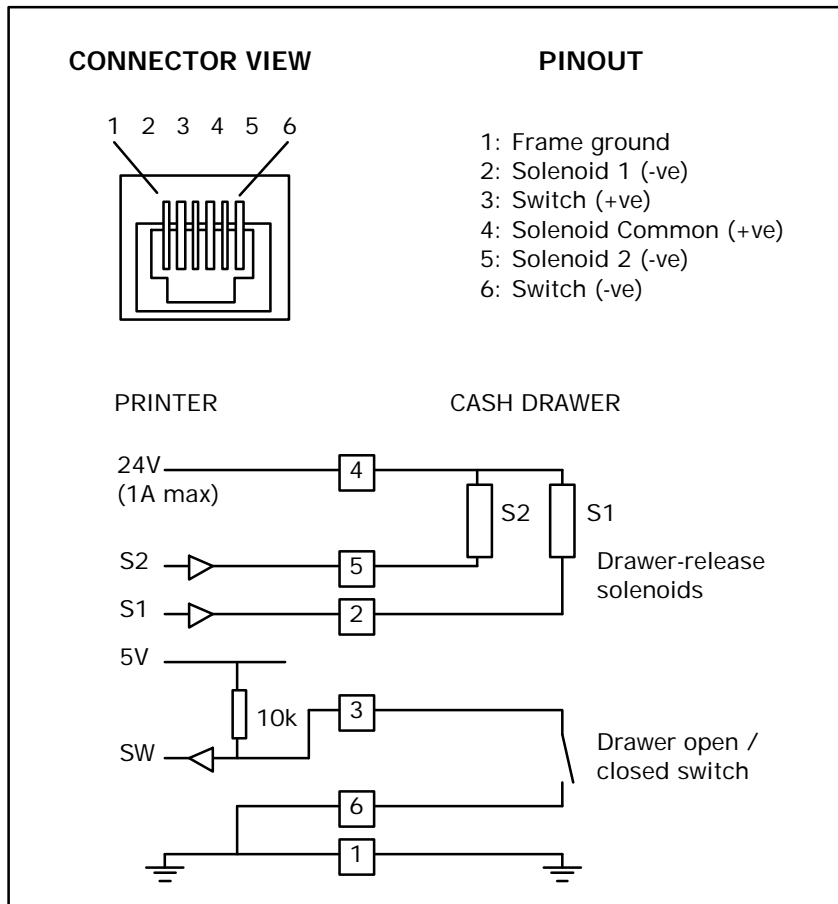


Centronics Connector



3.6.3. Draw Kick-out Connector

The connector used to open a cash drawer and monitor whether the drawer is open or closed is a 6-pin modular RJ11 connector.



3.7. Configuration of Switches

To set the switches the following procedure must be respected:

- Switch the printer off
- Set the switches as requested (see tables below).
- Switch the printer on

3.7.1. RS232 mode

Switches 1,2,3 and 6 are used to define functions. Switches 4 and 5 are used to set the data transmission speed.

Switch	ON	OFF
1	XON/XOFF control	DTR/DSR
2	No Parity	Parity
3	Odd parity	Even parity
6	(not used)	(not used)

Switch numbers 4 and 5 are dedicated to define the baud rate as follows :

Baud rate	Switch 4	Switch 5
4800	OFF	OFF
9600	ON	OFF
19200	OFF	ON
38400	ON	ON

3.7.2. Centronics mode

All switches should be set OFF for printers equipped with Centronics connectors.

3.8. Self Test

A self-test is invoked by pressing the paper feed button during a reset (power up or pressing on/off button). On entering the self-test mode, the printer checks its internal hardware and prints a report which will include the following information:

- Kanji set : on/off
- product reference
- serial number
- whether a cutter is fitted or not
- what type of interface is fitted
- switch settings (but not for Centronics versions)
- paper sensitivity setting (set via software)
- Address of printer
- Print density adjustment setting (set via software)
- internal RAM status

4. PRINTER CONTROL SOFTWARE

The APOS printer uses a superset of industry-standard software commands which can execute some powerful functions and, at the same time, protect your existing software investment.

4.1. Printable Characters

The first printable character serie corresponds to Page 0 of the international character set. Sending appropriate byte of data, given in the following table in decimal, will print corresponding character.

SEE ANNEXE 1

(SCANNED FIGURE TAKING TO MUCH MEMORY)

Other characters are printable in 24×24 level 1 and 2, their positions are given in the **JIS X 9052** standard.

However, to be compatible with other printer manufacturers, characters have been added to the JIS X 9052 standard :

- . In 0F0h line (those characters are shown on next page)
- . From 2660 to 267B (free places left in the JIS X 9052)
- . From 2860 to 287A (free places left in the JIS X 9052)

SEE ANNEXE 2

(SCANNED FIGURE TAKING TO MUCH MEMORY)

Printer Control Codes

Control codes are non-printable characters or sequences of characters which affect the subsequent operation of the printer. For your convenience, these are grouped below in logical sets of commands which can be used in the same context.

Throughout the following descriptions of the commands you will note that three special codes are used to cause the printer to interpret the following byte or bytes as part of a command and not as printable characters. These codes are:

Code	Name	Dec. value	Hex. value	
ESC	Escape	27	1B	General “escape sequence” commands
GS	Graphic Sequence	29	1D	Often used for special graphic commands
AX	Axiohm	31	1F	Special commands for the APOS printer
FS	KANJI sequence	28	1C	General Kanji commands

The general command syntax is as follows:

Command

(Description)	Name and description of the command
(Format)	The code sequence to be sent to the printer. <nnh> is used to represent the hexadecimal number nn <nn> is used to represent the decimal number nn [] k is used when the sequence included in [] must be repeated k times
(Comments)	Additional information such as range allowed for the numbers or default values
(Cross reference)	Related commands

4.1.1. ESC =

(Description)	Select device
(Format)	<1Bh> <3Dh> <n>
(Comments)	<p>It allows the user to select a printer.</p> <p>If n = 0 all the printers are deselected. If n = 1 to 32, the printer with address #n s selected, all the other printers are deselected. If n = 33 all the printers are selected.</p> <p>The default value is n =1</p>
(Cross reference)	–

4.1.2. AX P

(Description)	Adjust print density
(Format)	<1Fh> <50h> <n>
(Comments)	<p>This command allows the user to vary the print density by adjusting the heating time between -32% and +10% of the nominal setting in 0.25% steps.</p> <p>The percentage variation $\Delta\%$ is given by $\Delta\% = (n - 128) / 4$ $0 \leq n \leq 168$</p>
(Cross reference)	–

4.1.3. ESC v

(Description)	Send printer status byte
(Format)	<1Bh> <76h>
(Comments)	<p>The printer will transmit a single byte which reflects the status of the printer in accordance with the table below.</p> <p>This command is ignored if the printer is fitted with a Centronics interface because Centronics is not bi-directional.</p>
(Cross reference)	–

Bit	Function	bit = 0	bit = 1
0	(unused)	-	-
1	Door open	Close	Open
2	Paper	Present	Out
3	(unused)	-	-
4	(unused)	-	-
5	(unused)	-	-
6	(unused)	-	-
7	Cutter failure	No	Yes

4.1.4. AX V

(Description)	Send printer software version
(Format)	<1Dh> <56h>
(Comments)	The printer returns 4 characters representing the software version eg. "01.0" for Version 1.0
(Cross reference)	–

4.1.5. ESC @

(Description)	Initialize printer
(Format)	<1Bh> <40h>
(Comments)	Clears data in the buffer and initializes the printer settings.
(Cross reference)	–

4.1.6. ESC c5

(Description)	Enable / disable paper feed switch
(Format)	<1Bh> <63h> <35h> <n>
(Comments)	Paper feed disable if n is even Paper feed enabled if n is odd Default value is n = 0
(Cross reference)	–

4.1.7. ESC R

(Description)	Select international character set
(Format)	<1Bh> <4Ah> <n>
(Comments)	Modifies the set of printable characters in accordance with the table below. 0 <= n <= 10
(Cross reference)	–

n	Country	Ascii Character Code											
		23h 35	24h 36	40h 64	5Bh 91	5Ch 92	5Dh 93	5Eh 94	60h 96	7Bh 123	7Ch 124	7Dh 125	7Eh 126
0	U.S.A.	#	\$	@	[\]	^	`	{		}	~
1	France	#	\$	É	•	ç	§	^	`	é	ù	è	¨
2	Germany	#	\$	É	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	UK.	£	\$	@	[\]	^	`	{		}	~
4	Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	\$	@	•	\	é	^	ù	à	ò	è	ì
7	Spain	Pt	\$	@	ı	Ñ	¿	^	`	¨	ñ	}	~
8	Japan	#	\$	@	[¥]	^	`	{		}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

4.1.8. ESC D

(Description)	Set tab positions
(Format)	<1Bh> <44h> [<n>] k <00h>
(Comments)	<p>n represents the nth character position at which you wish the tab to be set. To set k tabs on a line, <n> must be sent k times ensuring that $n_1 \leq n_2 \dots \leq n_k$</p> <p>The string of data must be terminated by the null character <00h>.</p> <p>eg.:</p> <p>The command <1Bh> <44h> <09h> <0Ch> <16h> <00h> will set 3 tabs such that, by using the command HT one, two or three times, you will be able to start printing on the 10th, 13th or 23rd column.</p> <p>The default value for tab positions is every 8 characters. Any change made to the width of the characters before setting the tabs will be included in the tabs width, all the changes made after would be ignored.</p>
(Cross reference)	HT

4.1.9. ESC 3

(Description)	Define line spacing
(Format)	<1Bh> <33h> <n>
(Comments)	<p>The character line spacing is set to a pitch of $n/16$ mm</p> <p>$0 \leq n \leq 255$</p> <p>The default is $n = 68$ which is equivalent to about 4.2mm pitch.</p>
(Cross reference)	ESC 2

4.1.10. ESC 2

(Description)	Set to default line spacing
(Format)	<1Bh> <32h>
(Comments)	The default line spacing is $68/16$ mm (about 4.2mm)
(Cross reference)	ESC 3

4.1.11. ESC SP

(Description)	Set spacing to right of characters
(Format)	<1Bh> <20h> <n>
(Comments)	0 ≤ n ≤ 32, where n is specified in 1/8 mm units Default value is n=0 If double-width mode is selected, the amount of space is doubled.
(Cross reference)	—

4.1.12. ESC !

(Description)	Set print mode
(Format)	<1Bh> <21h> <n>
(Comments)	0 ≤ n ≤ 255 The value of n can be set to vary the mode of print according to the table below. Default value is n = 0 (ie. Font A in standard mode)
(Cross reference)	—

Bit	Function	Bit = 0	Bit = 1
0	Character Font	A	B
1	(not used)	-	-
2	(not used)	-	-
3	Emphasised	Cancelled	Set
4	Double height	Cancelled	Set
5	Double width	Cancelled	Set
6	(not used)	-	-
7	Underlined	Cancelled	Set

Front	Front Selected
A	12 × 24
B	9 × 17

4.1.13. ESC –

(Description)	Underline mode on / off
(Format)	<1Bh> <2Dh> <n>
(Comments)	0 <= n <= 2 If n=0, underline is turned off If n=1, underline mode of 1 dot-line thickness is selected If n=2, underline mode of 2 dot-line thickness is selected
(Cross reference)	–

4.1.14. ESC E

(Description)	Emphasised on / off
(Format)	<1Bh> <45h> <n>
(Comments)	The emphasized mode is selected if n is odd. The emphasized mode is cancelled if n is even.
(Cross reference)	ESC ! (set print mode)

4.1.15. ESC G

(Description)	Double-strike on / off
(Format)	<1Bh> <47>
(Comments)	The double-strike mode is selected if n is odd. The double-strikemode is cancelled if n is even.
(Cross reference)	ESC ! (set print mode)

4.1.16. ESC {

(Description)	Set / cancel upside-down character printing
(Format)	<1Bh> <7Bh> <n>
(Comments)	This command rotates the text by 180° so that it prints correctly when the printer is wall-mounted. Upside-down character is enabled if n is odd Upside-down character is disabled if n is even 0 <= n <= 255. Default value is n = 0 The command is valid only when it is used at the beginning of a line.
(Cross reference)	–

4.1.17. ESC V

(Description)	Set / cancel rotated characters
(Format)	<1Bh> <56h> <n>
(Comments)	This command allows each charcater to be rotated by 90° clockwise. 0 <= n <= 1 n = 0 cancels rotated printing n = 1 set rotating printing
(Cross reference)	–

4.1.18. HT

(Description)	Horizontal tab. Moves the printing position to the next horizontal tab position
(Format)	<09h>
(Comments)	Default tabs are every 8 characters
(Cross reference)	ESC D (set tabs)

4.1.19. ESC \$

(Description)	Set absolute position
(Format)	<1Bh> <24h> <n1> <n2>
(Comments)	Sets the print starting position to the specified number of dots (1/8 mm units) from the beginning of the line so that the position is $(n1 + n2 \times 256)$ dots from the left hand side, where $0 \leq n2 \leq 1$ If $n2 = 0$: $0 \leq n1 \leq 255$ If $n2 = 1$: $0 \leq n1 \leq 192$ ie: $0 \leq (n1 + n2 \times 256) \leq 576$ If the position exceeds the print area, the command is ignored.
(Cross reference)	ESC ¥

4.1.20. ESC ¥

(Description)	Set relative position
(Format)	<1Bh> <5Ch> <n1> <n2>
(Comments)	Sets the print starting position to the specified number of dots (1/8 mm units) from the current printing position, where $0 \leq n2 \leq 1$ If $n2 = 0$: $0 \leq n1 \leq 255$ If $n2 = 1$: $0 \leq n1 \leq 192$ ie: $0 \leq (n1 + n2 \times 256) \leq 576$ If the position exceeds the print area, the command is ignored.
(Cross reference)	ESC \$

4.1.21. ESC a

(Description)	Set left, centre or right justification
(Format)	<1Bh> <61h> <n>
(Comments)	Align the text to the specified position (left, center, right) Align left if $n=0$ (default) Align centre if $n=1$ Align right if $n=2$ This command only works at the start of a new line.
(Cross reference)	–

4.1.22. LF

(Description)	Print contents of buffer and advance paper
(Format)	<0Ah>
(Comments)	Moves the print position to the beginning of the next print line
(Cross reference)	ESC 2, ESC 3

4.1.23. ESC d

(Description)	Print and line feed n character lines
(Format)	<1Bh> <64h> <n>
(Comments)	This command prints the line in the buffer and performs n blank lines including the line in the buffer. 0 <= n <= 255
(Cross reference)	–

4.1.24. ESC J

(Description)	Print and line feed n dot lines
(Format)	<1Bh> <4Ah> <n>
(Comments)	The printer prints the data in buffer, feeds the paper by n/16 mm and moves the print position to the beginning of the line. 0 <= n <= 255
(Cross reference)	LF, ESC d, ESC 2, ESC 3

4.1.25. ESC i

(Description)	Perform full cut
(Format)	<1Bh> <69h> <n>
(Comments)	The command is valid only when a cutter is fitted.
(Cross reference)	ESC m

4.1.26. ESC m

(Description)	Perform partial cut
(Format)	<1Bh> <6Dh> <n>
(Comments)	The command is valid only when a cutter is fitted.
(Cross reference)	ESC i

4.1.27. AX C

(Description)	Select cut position
(Format)	<1Fh> <43h> <n>
(Comments)	If n = 0, cut command will cut under last printed line. If n = 1, cut command will cut over last printed line. 0 <= n <= 1 Default value is n = 1
(Cross reference)	ESC i, ESC m

4.1.28. GS w

(Description)	Set horizontal magnification of bar code
(Format)	<1Dh> <77h> <n>
(Comments)	n defines how many 1/6mm units are used to print the thin line of each barcode symbology. The thick lines will be set to twice the value of n. 2 <= n <= 4 Default value is n = 3
(Cross reference)	GS h, GS k

4.1.29. GS h

(Description)	Select vertical height of bar code
(Format)	<1Dh> <68h> <n>
(Comments)	The vertical height will be set to n 1/8 mm units. 1 <= n <= 255 Default value is n = 162
(Cross reference)	GS k, GS w

4.1.30. GS k

(Description)	Print bar code
(Format)	<1Dh> <6Bh> <n> [<d>] k <00h>
(Comments)	n selects the bar code system to be used in accordance with the table below. k is the number of <d> to be sent and will vary from one bar code symbology to another.
(Cross reference)	GS w, GS h

n	Bar code symbology
0	UPC-A
1	UPC-E
2	EAN13
3	EAN8
4	Code39
5	Interleaved 2/5 (ITF)
6	Codabar
7	Code 128A
8	Code 128B
9	Code 128C

4.1.31. GS f

(Description)	Select font for bar code data
(Format)	<1Dh> <66h> <n>
(Comments)	If n = 0, font A is used. If n = 1, font B is used. 0 <= n <= 1
(Cross reference)	GS H

4.1.32. GS H

(Description)	Select printing position of bar code data
(Format)	<1Dh> <48h> <n>
(Comments)	The value of n is used to set how the characters will be printed in accordance with the following table.
(Cross reference)	GS f

n	Printing position
0	Not printed
1	Above bar code
2	Under bar code
3	Above and under bar code

4.1.33. ESC &

(Description)	Define user-defined characters.
(Format)	<1Bh> <26h> <s> <n> <m> [72] (m-n+1)
(Comments)	<p>Each character is defined as an array of dots (bits) which is s-bytes high by a-bytes wide. The array contains bytes which represent the character 'scanned' from top to bottom and then from left to right. The first byte of the array (byte p1) represents the top-left corner of the character with the most-significant bit (MSB) at the top and the least-significant bit (LSB) seven dots below it. Where any bit of the array contains a 1, a dot will be printed, where it contains a 0, no dot will be printed. Thus s x a bytes are sent to define each character.</p> <p>The newly-defined characters will overwrite the existing Ascii characters between characters 32 and 126 starting from character number n to character number m. Therefore, the character array must be sent (m-n+1) times. If only 1 character is being sent, m should be set to the same value as n. The new definitions will be retained unless over-written by a new definition, until a reset command is sent (ESC @) or until a bit image is defined (command GS *).</p> <p>1 <= s <=3 (ie. characters are 8, 16 or 24 bits high) 32 <= n <= m <= 126 Width of the font presently selected (see command AX f) <= a <= 12 The values <p1> to <ps x a> are all single-byte numbers</p> <p>If the defined width of the new character, <a>, is less than the width of the currently-selected font then the new font will take the same width as the current font and so will include blank spaces to its right. Therefore this command prohibits the definition of proportional fonts. In that case you should use the related command AX &</p>
(Cross reference)	ESC %, AX &

4.1.34. AX &

(Description)	Define proportional characters
(Format)	<1Fh> <26h> <s> <n> <m> [<a> <p1> <p2> ... <ps x a>] (m-n+1)
(Comments)	<p>This command works as the ESC & command but allows the definition of characters smaller than the selected font so that a proportional font may be defined.</p> <p>Each character is defined as an array of dots (bits) which is s-bytes high by a-bytes wide. The array contains bytes which represent the character 'scanned' from top to bottom and then from left to right. The first byte of the array (byte p1) represents the top-left corner of the character with the most-significant bit (MSB) at the top and the least-significant bit (LSB) seven dots below it. Where any bit of the array contains a 1, a dot will be printed, where it contains a 0, no dot will be printed. Thus s x a bytes are sent to define each character.</p> <p>The newly-defined characters will overwrite the existing Ascii characters between characters 32 and 126 starting from character number n to character number m. Therefore, the character array must be sent (m-n+1) times. If only 1 character is being sent, m should be set to the same value as n. The new definitions will be retained unless over-written by a new definition, until a reset command is sent (ESC @) or until a bit image is defined (command GS *).</p> <p>1 <= s <=3 (ie. characters are 8, 16 or 24 bits high) 32 <= n <= m <= 126 0 <= a <= 16 The values <p1> to <ps x a> are all single-byte numbers</p>
(Cross reference)	–

4.1.35. ESC %

(Description)	Enable / disable user-defined character set
(Format)	<1Bh> <25h> <n>
(Comments)	<p>If n is odd, the user defined set is selected. If n is even, the user defined set is cancelled (the internal set is used). Default value is n = 0. The user defined character set and a downloaded bit image can not be defined at the same time.</p>
(Cross reference)	ESC & (define character set)

4.1.36. GS *

(Description)	Define down-loaded bit image
(Format)	<1Dh> <2Ah> <n1> <n2> [<d>] k
(Comments)	<p>The bit image is defined as an array whose width is 8 x n1 bytes and whose height is n2 bytes.</p> <p>As for the user-defined characters, the image data, [<d>], is defined with the MSB at the top and with data sent to represent the image "scanned" from top to bottom and then left to right. Therefore, there will need to be k bytes of data sent to make up the entire image, where $k = (n1 + n2 \times 8)$</p> <p>1 <= n1 <= 255 1 <= n2 <= 48 n1 x n2 <= 1311</p> <p>Note that the maximum size image which may be printed is if n1 is 56, however, for software compatibility with older printers the maximum value possible is 255. If the logical image is larger than may be physically printed then only part of the image will be printed and the other data will be ignored.</p> <p>The bit image will remain valid until ESC @ or ESC & or FS 2 is executed or a new image is loaded.</p>
(Cross reference)	GS /

4.1.37. GS /

(Description)	Print down-loaded bit image
(Format)	<1Dh> <2Fh> <m>
(Comments)	<p>The bit image defined by the command GS * is printed in accordance with the table below and depending on the value of the mode byte <m>.</p> <p>0 <= m <= 3</p>
(Cross reference)	GS *

m	Mode
0	Normal
1	Double width
2	Double height
3	Double width and double height

4.1.38. ESC *

(Description)	Print bit image
(Format)	<1Bh> <2Ah> <m> <n1> <n2> [<d>] (k x n)
(Comments)	<p>The mode of printing the bit image is defined by the value of m as given in the table below. m = 0, 1, 32 or 33 Beware that if an invalid value of m is sent, the command will be ignored and the following bytes may be interpreted as either printable or control characters.</p> <p>The bit image itself is defined as an array whose height is n bytes where for m = 0 or 1: n = 1 for m = 32 or 33: n = 3</p> <p>The width is defined by the double-byte number <n1> <n2>. In normal density, 1 bit represents a width of 2 dots but in double density, 1 bit represents a width of 1 dot so the width of the data array is therefore k bytes where</p> <p>$k = (n1 + n2 \times 256)$ When m = 0 or 32: $0 \leq k \leq 288$ When m = 1 or 33: $0 \leq k \leq 576$</p> <p>As for the user-defined characters, the image data, [d], is defined with the MSB at the top and with data sent to represent the image “scanned” from top to bottom and then left to right. Therefore, there will need to be (k x n) bytes of data sent to make up the entire image. If k exceeds the values given above, subsequent data transfers will be ignored.</p>
(Cross reference)	–

m	Mode	Vertical direction		Horizontal direction	
		# Dots	Density	# Dots Max	Density
0	8 dot single density	8	2 dots/mm	288	3 dots/mm
1	8 dot double density	8	2 dots/mm	576	6 dots/mm
32	24 dot double density	24	6 dots/mm	288	3 dots/mm
33	24 dot double density	24	6 dots/mm	576	6 dots/mm

4.1.39. ESC p

(Description)	Generate solenoid pulse
(Format)	<1Bh> <70h> <m> <n1> <n2>
(Comments)	<p>Generates a pulse on pin m of the drawer kickout connector in accordance with the table below.</p> <p>n1 x 2 ms is the on-time of the pulse. n2 x 2 ms is the off-time of the pulse. 0 ≤ n1 ≤ n2 ≤ 255</p>
(Cross référence)	–

m	Connector	Pin
0	1	2
1	1	5
2	2	2
3	2	5

4.1.40. ESC u

(Description)	Transmit cash drawer status
(Format)	<1Bh> <75h> <n>
(Comments)	<p>To request status of drawer 1, set n=0 To request status of drawer 2, set n=1 0 ≤ n ≤ 1</p> <p>The printer returns a single byte. If the return byte is 0 (zero) the drawer is closed. If the return byte is non-zero, the drawer is open.</p> <p>This command is ignored if the printer is fitted with a Centronics interface because Centronics is not bi-directional.</p>
(Cross reference)	–

4.1.41. GS C0

(Description)	Select counter print mode
(Format)	<1Dh> <43h> <30h> <m> <n>
(Comments)	<p>Sets the format of how the counter is printed.</p> <p>$0 \leq m \leq 5$ If $m = 0$, all digits of the counter will be printed, otherwise <m> of the least-significant digits will be printed. The default value is $m=0$</p> <p>$0 \leq n \leq 2$ The value of <n> describes how the printed counter value shall be justified as shown in the table below. Both m and n are ignored if out of range.</p>
(Cross reference)	GS c, GS C, GS C1, GS C2

n	Adjustment	Empty digits filled
0	right	with spaces
1	right	with 0s
2	left	with spaces

4.1.42. GS C1

(Description)	Select binary counter mode
(Format)	<1Dh> <43h> <31h> <n1> <n2> <n3> <n4> <n5> <n6>
(Comments)	<p>The start value of the counter is $\text{start} = (n1 + n2 \times 256)$, default value is 1 The end value of the counter is $\text{end} = (n3 + n4 \times 256)$, default value is 65535</p> <p>If $\text{start} > \text{end}$, the counter will increment after each time the command GS c is used. If $\text{end} > \text{start}$, the counter will decrement after each time the command GS c is used. When the counter exceeds the value of end it will reset to the value of start.</p> <p>The increment or decrement step is the value of n5. Setting this value to 0 will stop the counter.</p> <p>The counter will reset to the value start only n6 times. After this it will stop counting. Also, setting this value to 0 will stop the counter.</p> <p>$0 \leq n1, n2, n3, n4, n5, n6 \leq 255$</p>
(Cross reference)	GS C0, GS C2, GS c, GS C

4.1.43. GS C2

(Description)	Set binary counter value
(Format)	<1Dh> <43h> <32h> <n1> <n2>
(Comments)	<p>Counter value = $n1 + n2 \times 256$ Default values are $n1 = 1$, $n2 = 0$</p> <p>If the counter value is out of range it will be converted to the maximum (if counting-down) or minimum (if counting-up) value defined by GS C1 or GS C.</p>
(Cross reference)	GS C0, GS C1, GS C, GS c

4.1.44. GS C

(Description)	Select decimal count mode
(Format)	<1Dh> <43h> <3Bh> <n1> <3Bh> <n2> <3Bh> <n3> <3Bh> <n4> <3Bh> <n5> <3Bh>
(Comments)	<p>With this counter, all parameters are entered as binary-coded decimal digits and separated by a semi-colon character, <3Bh>. Any omitted parameter will keep its previous value.</p> <p>n1 is the start value of the counter n2 is the end value of the counter The counter will initially take the value given by n5</p> <p>If start > end, the counter will increment after each time the command GS c is used. If end > start, the counter will decrement after each time the command GS c is used. When the counter exceeds the value of end it will reset to the value of start.</p> <p>The increment or decrement step is the value of n3. Setting this value to 0 will stop the counter. The counter will reset to the value start only n4 times. After this it will stop counting. Also, setting this value to 0 will stop the counter.</p> <p>$0 \leq n1, n2, n5 \leq 65535$ $0 \leq n3, n4 \leq 255$</p>
(Cross reference)	GS C0, GS C1, GS C2, GS c

4.1.45. GS c

(Description)	Print counter value
(Format)	<1Dh> <63h>
(Comments)	Puts the current value of the counter in the print buffer & updates the counter. The format of the printed value is set by the GS C0 command.
(Cross reference)	GS C, GS C0, GD C1, GS C2

4.1.46. GS :

(Description)	Set start / end of macro definition
(Format)	<1Dh> <34h>
(Comments)	The macro definition starts and ends with this command. The length of the macro must not exceed 2048 bytes.
(Cross reference)	GS ^

4.1.47. GS ^

(Description)	Execute macro
(Format)	<1Dh> <5Eh> <n1> <n2> <n3>
(Comments)	The macro defined between the GS : commands will be executed n1 times. t is the time to wait before executing the macro where the time t is given by $t = n2 \times 100 \text{ ms}$ n3 specifies the way to execute the macro in accordance with the table below.
(Cross reference)	GS :

n3	Executing mode
0	Continuous mode : The macro is executed n1 times with interval t between each execution.
1	Paper feed button mode: After waiting t, the led blinks and the printer waits for the paper feed button to be pushed to execute the macro. This operations is repeated n1 times.

4.1.48. FS !

(Description)	Specifies Kanji print mode
(Format)	<1Ch> <21h> <n>
(Comments)	0 <= n <= 255 The value of n can be set to vary the mode of print according to the table below. Default value is n = 0

Bit	Function	Bit = 0	Bit = 1
0	(not used)	-	-
1	(not used)	-	-
2	Double height	Cancelled	Set
3	Double width	Cancelled	Set
4	(not used)	-	-
5	(not used)	-	-
6	(not used)	-	-
7	Underlined	Cancelled	Set

4.1.49. FS &

(Description)	Specifies Kanji mode
(Format)	<1Ch> <26h>
(Comments)	Valid if self test detects the special added Kanji board which means : KANJI SET = ON
(Cross référence)	

4.1.50. FS -

(Description)	Specifies Kanji underlined mode
(Format)	<1Ch> <2Dh> <n>
(Comments)	0<= n<= 2
(Cross référence)	

n	Function
0	cancel underlined Kanji
1	1 dot underlined Kanji
2	2 dots underlined Kanji

4.1.51. FS .

(Description)	Cancels Kanji mode
(Format)	<1Ch> <2Eh>
(Comments)	
(Cross référence)	

4.1.52. FS S

(Description)	Specifies Kanji space amount
(Format)	<1Ch> <53h> <n1> <n2>
(Comments)	0<= n1 <= 32 0<= n2 <= 32
(Cross reference)	n1 defines left space in dots n2 defines right space in dots

4.1.53. FS W

(Description)	Specifies Kanji 4 fold mode
(Format)	<1Ch> <57h> <n>
(Comments)	0<= n<= 255
(Cross reference)	

n	Function
0	cancels 4 fold Kanji
1	specifies 4 fold Kanji

4.1.54. FS 2

(Description)	Specifies external character
(Format)	<1Ch> <32h> <a1> <a2> <Dn>
(Comments)	(see next page)
(Cross reference)	

Defining the external characters FS + '2' + a1 + a2 + Dn

Kanji characters are down loaded one by one

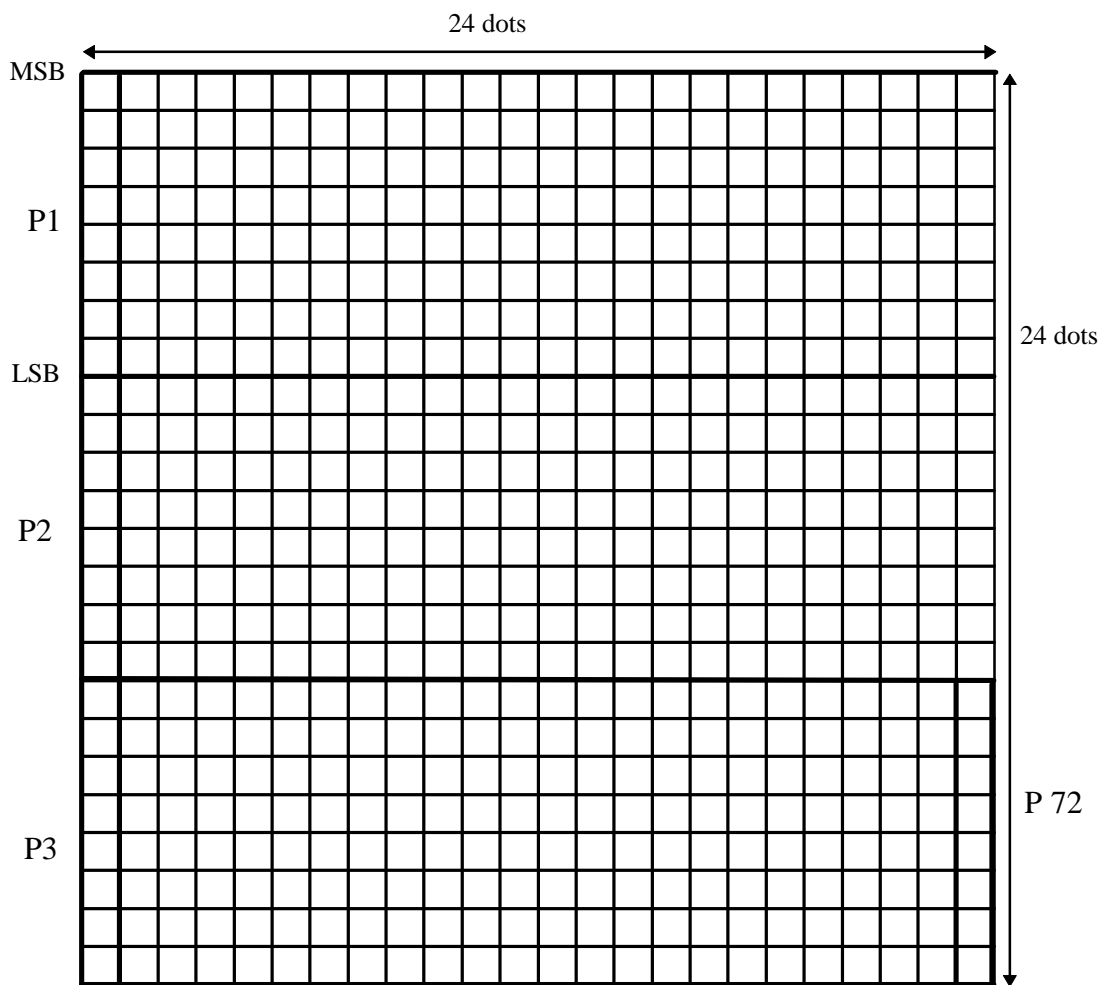
Code : 1Ch + 32h + a1 + a2 + Dn

a1 = 77h or 78h

a2 = 21h to 7Eh (meaning 94 characters)

Dn = p1, p2, p3 ... p72 (= 72 data kanji 24 × 24)

a1	Modify font user (see code ESC &)
77h	Font user A
78h	Font user B



If images are loaded, they use down loading fonts (see page 31 ESC &)

If a problem occurs in down loading mode (for row or column code), printer indicates

! + 36 data in Kanji mode, and !* + 72 data in ascii mode.

5. Spare Parts

All spare parts kits are supplied as individually packaged loose parts, there is a possibility of obtaining different groups of spare parts kits. AXIOM customer service will provide the list later.

Reference	Designation
3101042	Knife blade kit
	AXIOHM sticker
	Left knife support
	Right knife support
	Ground strap
	XPGE cover assembly
	Packing box
	Rotating knife assembly
	Drive arm
	Grip ring
	Screw N°2-4
	Screw M2.5-8

3101044	Knife motor kit
	80×120 Minigrip bag
	AXIOHM sticker
	Packing box
	Stepper motor
	N°2 Label
	Separator
	Lock washer AZ3
	Screw M3-6

3101046	Door open switch kit
	60×40 Minigrip bag
	AXIOHM sticker
	Packing box
	Door switch
	Lock washer AZ2
	Screw N°2-10

3101047	Knife switch kit
	60×80 Minigrip bag
	AXIOHM sticker
	Packing box
	Separator
	Switch without arm
	Lock washer AZ2
	Screw N°2-10

3101051	Paper guide knife kit
	80×120 Minigrip bag
	AXIOHM sticker
	Packing box
	Upper paper guide

3101052	Printhead spring kit
	80×120 Minigrip bag
	AXIOHM sticker
	Packing box
	Printhead spring
	Separator

3101053	Cover open kit
	60×80 Minigrip bag
	AXIOHM sticker
	Packing box
	Cover spring

3101709	Power supply kit
	Power supply 50W
	Power cable

3102263	Paper feed motor kit
	80×120 Minigrip bag
	AXIOHM sticker
	Packing box
	Power supply label (220 V)
	Stepper motor
	Separator
	Lock washer AZ3
	Screw M3-6

3102264	Cover open switch kit
	60×40 Minigrip bag
	AXIOHM sticker
	Packing box
	Cover switch
	Lock washer AZ2
	Screw N°2-10

3102265	Paper out kit
	60×40 Minigrip bag
	AXIOHM sticker
	Packing box
	Equipped opto-sensor support

3102269	Ground kit
	60×40 Minigrip bag
	AXIOHM sticker
	Packing box
	Ground strap
	Screw M2, 5-4
	Screw N°2-4

3102792	Bucket assembly kit
	AXIOHM sticker
	Mechanism assembly XAPOS
	Packing box

3103210	Kanji memory expansion kit
	60×80 Minigrip bag
	AXIOHM sticker
	Packing box
	AXIOHM Label
	Kanji expansion board
	Antistatic bag

3103211	8 dots/mm Printhead kit
	60×80 Minigrip bag
	AXIOHM sticker
	Packing box
	8 dots/mm printhead
	Antistatic bag 203 × 254
	Screw M2,5-4

3103212	Equipped platen kit
	80 × 120 Minigrip bag
	AXIOHM sticker
	Packing box
	Separator
	Platen
	Platen gear

3103213	Small parts kit
	60×80 Minigrip bag
	AXIOHM sticker
	Packing box
	Left knife support
	Right knife support
	Ground strap
	Intermediate gear (2040)
	Intermediate gear (15 / 63)
	Drive gear (38 / 59)
	Drive gear (38)
	Drive arm
	Lock washer AZ2
	Grip ring
	Screw N°
	Screw M
	Screw N°
	Screw N°
	Screw M2,5-8